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(54) **Fluorine-doped quartz glass article and manufacturing method thereof**

(57) A method for manufacturing a fluorine-doped quartz glass article by sintering a porous glass preform moving in a heat zone in an atmosphere of a fluorine gas is disclosed, wherein a fluorine gas process is performed by setting a moving speed of the porous glass preform in the heat zone heated at 1000°C or more in order that L/V is 40 minutes or more, where L is the

length (mm) of a heater, and V is the moving speed (mm/min). The temperature of the heat zone may be vitrification temperature. The fluorine gas process may be performed in the heat zone which is at 1000°C or more not to perform a vitrification process, and then the vitrification process may be performed by increasing the temperature of the heat zone.

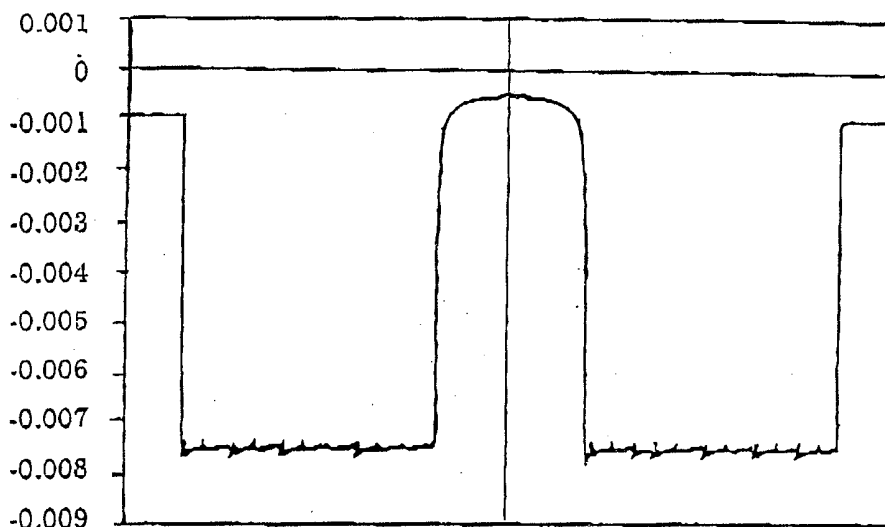


FIG. 1

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EUROPEAN SEARCH REPORT

Application Number
EP 04 09 0131

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		-/--	
2	The present search report has been drawn up for all claims		
Place of search The Hague		Date of completion of the search 12 April 2005	Examiner Stroud, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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EUROPEAN SEARCH REPORT

Application Number
EP 04 09 0131

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<div style="border: 1px solid black; height: 150px; width: 100%;"></div>			
<div style="border: 1px solid black; padding: 5px;"> <p>The present search report has been drawn up for all claims</p> </div>			
Place of search		Date of completion of the search	Examiner
The Hague		12 April 2005	Stroud, J
<div style="display: flex; justify-content: space-between;"> <div> <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone</p> <p>Y : particularly relevant if combined with another document of the same category</p> <p>A : technological background</p> <p>O : non-written disclosure</p> <p>P : intermediate document</p> </div> <div> <p>T : theory or principle underlying the invention</p> <p>E : earlier patent document, but published on, or after the filing date</p> <p>D : document cited in the application</p> <p>L : document cited for other reasons</p> <p>.....</p> <p>& : member of the same patent family, corresponding document</p> </div> </div>			

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-7



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**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-7

Process for flourine doping a porous silica glass preform directed to zone heating and minimum residence time of preform in hot zone for obtaining uniform dopant distribution

2. claims: 8-14

Process for flourine doping a porous silica glass preform directed to doping under positive pressure to suppress hydroxyl group content in preform and product so obtained

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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12-04-2005

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82